What is claimed is:

1. A fuel cell comprising a gas diffusion electrode, a gas diffusion counter-electrode, a solid electrolyte membrane located between the electrode and counter-electrode, wherein the electrode or the counter-electrode or both comprise at least one modified carbon product, wherein said modified carbon product comprises a carbon product having attached at least one organic group.

2. The fuel cell of claim 1, wherein said solid electrolyte membrane comprises at least one modified carbon product, wherein said modified carbon product comprises a carbon product having attached at least one organic group.

3. The fuel cell of claim 1, wherein said gas diffusion electrode and gas diffusion counter-electrode each comprise a blocking layer and an active layer.

4. The fuel cell of claim 3, wherein said active layer or said blocking layer or both comprise at least one modified carbon product, wherein said modified carbon product comprises a carbon product having attached at least one organic group.

5. The fuel cell of claim 3, wherein said active layer has a thickness of less than about 10 microns.

6. The fuel cell of claim 3, wherein said active layer comprises at least one modified carbon product, wherein said modified carbon product comprises a carbon product having attached at least one organic group and a metal catalyst.

7. The fuel cell of claim 3, wherein said active layer has no fluoropolymer binder present.

8. The fuel cell of claim 1 wherein said solid electrolyte membrane comprises polytetrafluoroethylene.

9. A fuel cell comprising a gas diffusion electrode, a gas diffusion counter-electrode, a solid electrolyte membrane located between the electrode and counter-electrode, wherein said solid electrolyte membrane comprises at least one modified carbon product, wherein said modified carbon product comprises a carbon product having attached at least one organic group.

10. The fuel cell of claim 1, wherein said organic group is $-C_6H_4SO_3^-$.

11. A method to reduce the thickness of a solid electrolyte membrane comprising forming said electrolyte membrane with a modified carbon product, wherein said modified carbon product comprises a carbon product having attached at least one organic group.

12. A method for increasing catalyst accessibility in an electrode comprising forming an active layer with a modified carbon product in the absence of a fluoropolymer binder, wherein said modified carbon product comprises a carbon product having attached at least one organic group.

13. The method of claim 12, further comprising the deposition of a catalytic material on said modified carbon product.

14. The fuel cell of claim 1, wherein said organic group is a proton conducting group, an electron conducting group, or both.

15. The method of claim 11, wherein said organic group is a proton conducting group, an electron conducting group, or both.

16. The method of claim 12, wherein said organic group is a proton conducting group, an electron conducting group, or both.